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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

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WRITTEN OPINION

(PCT Rule 66)

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from the above date of mailingInternational application No.
PCT/JP 03/08935International filing date (day/month/year)
14.07.2003Priority date (day/month/year)
16.07.2002International Patent Classification (IPC) or both national classification and IPC
G09G5/24Applicant
SHARP KABUSHIKI KAISHA et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☒ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 16.11.2004

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I. Basis of the opinion

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, Pages

1-82 as originally filed

Claims, Numbers

1-41 as originally filed

Drawings, Sheets

1/14-14/14 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:

3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this opinion:

- ☒ all parts.
- ☐ the parts relating to claims Nos. .

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	
Inventive step (IS)	Claims	1-41
Industrial applicability (IA)	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following document/s/:
 - D1: EP-A-1 158 485 (SHARP KK) 28 November 2001 (2001-11-28)
 - D2: EP-A-0 883 103 (THOMSON MULTIMEDIA SA) 9 December 1998 (1998-12-09)
 - D3: EP-A-0 907 158 (SHARP KK) 7 April 1999 (1999-04-07)
 - D4: US-A-5 475 399 (BORSUK SHERWIN M) 12 December 1995 (1995-12-12)
 - D5: WINKLER R ET AL: "READABILITY OF ELECTRONIC DISPLAYS" PROCEEDINGS OF THE SID, SOCIETY FOR INFORMATION DISPLAY. PLAYA DEL REY, CA, US, vol. 21, no. 4, 1980, pages 309-313, XP009020838

2. The first invention of the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-13 and 16-23 does not involve an inventive step in the sense of Article 33(3) PCT.
- 2.1 The document **D1** is regarded as being the closest prior art and discloses (- cf. independent claims 1 and 16) a display apparatus comprising:
a display device (- 3 - Fig. 8d) including a display screen (- Figs. 1-4) for displaying characters and/or graphics, wherein each of the characters and /or graphics contains a basic portion (- Level 3 - Figs. 1-4; bits "1" or "0" - Figs. 13A-16D and para. [0150]) and a neighbouring portion (- Levels 1, 2 - Figs. 1-4; bits with "*" - Figs. 13A-16D and para. [0150]) arranged in the vicinity of the basic portion; and
a control section (- 20, 40 - Fig. 8d) for controlling the display device;
wherein the control section sets a luminance level of the neighbouring level of the basic portion and a luminance level of neighbouring portion (- "brightness table generation program 6b" - Fig. 8d and individual levels of R,G,B - Fig. 5); and
the control section controls the display device so that the character and/or graphics are displayed on the display screen (- graphic displaying procedure - Fig. 10) using the set luminance of the basic portion and the set luminance level of the neighbouring portion.
- 2.1a The subject-matter of claim 1 therefore differs from that known from D1 in that: the control section controls the display device in accordance with the intensity of light for irradiating the display screen.

The problem to be solved by the present invention may therefore be regarded as maintaining the visibility and/or colour balance of the image displayed on the display screen in accordance with the intensity of ambient light or light from a backlight.

- 2.1b The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

D2, in common with D1 discloses corresponding features of:

- a display device (- panel 10 - Figs. 2-4); and
- a control section (- 32, 42 and 34 - Figs. 2-4 and "circuit 34 for controlling colours" - col. 2, line 48).

In addition, D2 Furthermore discloses:

the control section controls the display device in accordance with the intensity of light for irradiating the display screen

(- "The tables in the circuit 32 or 42 provide a correction which maintains the colors when the intensity of ambient light or the intensity of the back source is changing. " - col. 3, lines 43-46).

As such therefore, the respective subject matters of the apparatus of independent claim 1 and the method of independent claim 16 are considered to comprise no more than:

- i) the application of a technique, known from D2, of maintaining the colour balance of images displayed on an LCD in accordance with the intensity of light from the environment, i.e. ambient light, or light from a backlight,
- ii) in a LCD, known from D1, in which characters and/or graphics, consisting of colour sub-pixels, comprise a basic portion and a neighbouring portion.

Accordingly, in light of PCT-Guidelines IV, Chapter IV-8.8, A1(v), the respective subject matters of independent claim 1 and 16 are not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D2 within the meaning of Article 33(3) PCT.

2.2 In addition (- cf. independent claims 22 and 23), insofar as it is well known in the art to employ LCDs as a display monitor of a computer, any said such computer employing:

- a program for displaying characters and/or graphics; and
- a recording medium, storing such a program,

the respective subject matters of independent claims 22 and 23 are also not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D2 within the meaning of Article 33(3) PCT.

2.3 In respect of the dependent claims:

2.3a It is submitted that the natural consequence of (- cf. dependent claim 2 and 17):

- i) applying the correction of the technique known from D2 in
- ii) a display known from D1,

is that at least one of the luminance level of the basic portion and the luminance level of the neighbouring portion will be corrected (- col. 3, lines 43-46) in

accordance with the intensity of light for irradiating the display screen.

Accordingly, the respective subject matters of dependent claim 2 and 17 are not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D2 within the meaning of Article 33(3) PCT.

2.3b Furthermore, D1 also discloses (- cf. dependent claim 3 and 18)

- the luminance level of the neighbouring portion is changed stepwise with an increase in a distance from the basic portion
(- levels 1, 2 - Figs. 1-4, and "correction pattern (5321)" - Fig. 25C and para. [0195])

Accordingly, the respective subject matters of dependent claims 3 and 18 are also not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D2 within the meaning of Article 33(3) PCT.

2.3c In addition, both D1 and D2 further disclose (- cf. dependent claims 4,5 and 19, 20):

- a plurality of colour elements
(D1 - R, G, B - Figs. 1-7 and 13B);
(D2 - "controlling the [RGB] colors [...] of panel 34" - col. 2, lines 48, 49 and 54);
- each of the plurality of pixels comprises a plurality of sub-pixels, each of the plurality of subpixels is associated with one of a plurality of color elements
(D1 - Figs. 1-7 and 13B),
(D2 - implicit insofar as D2 discloses the use of "a [single] light source 16" - Figs. 2-4 and col. 2, lines 33-34, and "provides the color signals R, G, and B to the panel 10" - col. 2, lines 54, 55).

D1 also discloses (- cf. dependent claim 6):

- the basic portion and the neighbouring portion are assigned the plurality of sub-pixels (- Figs. 1-4).

Accordingly, the respective subject matters of dependent claims 4-6 and 19, 20 are also not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D2 within the meaning of Article 33(3) PCT.

2.3d D2 further discloses (- cf. dependent claims 7-9, 13 and 21):

- a light irradiation section (- light source 16 - Figs. 1-4); and
- the control section (- 22, 32, 42, 34 - Figs. 2-4) sets the luminance level of [characters and/or graphics] in accordance with:
 - the intensity of light to be emitted
 - (- intensity control circuit 22 controls signals to circuit 34 for controlling the colours via interface circuit 32, 42 - Figs. 2-4 and see col. 2, lines 44-49)
 - on or off state of the light irradiation section
 - (- implicit that if no power is supplied to the intensity control circuit 22, then no signals will be sent to said interface 32)
- an irradiation level(- outputs 32₁, 32₂, 32₃ - Fig. 2 and col. 2, lines 44-49) indicating the intensity of light to be emitted from the light irradiation section to the display.

Accordingly, the respective subject matters of dependent claims 7-9, 13 and 21 are also not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D2 within the meaning of Article 33(3) PCT.

2.3e Furthermore (- cf. dependent claims 11 and 12), both D1 and D2 each disclose respective memory tables:

(D1 - "correction pattern tables 5b" of Auxiliary storage 40 - Figs. 8A-8D)

(D2 - "Interface circuits 32 and 42 comprise a memory of the ROM type in which data are stored as tables corresponding to curves. More precisely the signal at the input 30, or 421, is, inside circuit 32 or 42, divided into a given number of value ranges. To each range corresponds a set of three curves gamma R, gamma G and gamma B. " - col. 3, lines 27-32)

Accordingly, the respective subject matters of dependent claims 11 and 12 are also not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D2 within the meaning of Article 33(3) PCT.

2.4 In common with D1, D3 discloses (- cf. independent claim 1 and dependent claim 10) a display apparatus comprising:

- a display device (- 1 - Fig. 1 and Figs. 6A-6D);
- a control section (- 5,8 - Fig. 3); and
- a light irradiation section disposed at a rear of the display medium (- 3 - Fig. 3; NB while D1 does not explicitly disclose the use of a backlight, insofar as D1 discloses the display apparatus comprises "a transmission type [LCD]" (- para.

[0112], lines 4,5) this is considered to be implicitly disclosed by D1).

In addition, D3 further discloses that said control section

- sets a luminance level of [characters and/or graphics] in accordance with the intensity of light for irradiating the display screen
 - (- "Character Size" - Fig. 7;
 - "The display control section changes a display configuration of the data to be displayed on the display panel when the illumination instruction section outputs the backlight illumination instruction" - para. [0018], last four lines, wherein an increased character size is considered to provide a corresponding increase in luminance; and
 - "display[s] the data stored in the display buffer in reverse video [in response to a backlight illumination instruction]" - para. [0027]).

2.4a It is acknowledged that while D1 discloses both reflection type LCDs and transmission type LCDs, D1 fails to disclose a LCD comprising both:

- a display medium and a reflection section; and
- a light irradiation section disclosed at a rear of the display medium,

nor does D1 disclose the control section along the lines of that mentioned in the last two paragraphs of dependent claim 10.

2.4b As such therefore, the problem to be solved by the invention as claimed in respect of dependent claim 10 may therefore be regarded as that of improving the visibility of a reflection type display when the ambient light from the environment is insufficient.

However (- cf dependent claim 10), D3 which also discloses the display apparatus disclosed therein as comprising:

- a display medium (- 2 - Fig. 2) and a reflection section (- reflector 2a - Fig. 2 and para. [0043]).

Furthermore also discloses said display apparatus as also comprising (- cf. last two paragraphs of dependent claim 10):

- the control section switches between a transmission mode (- "Is Backlight key Actuated", S27, S28 - Fig. 5) in which light to be emitted from the light irradiation section is transmitted through the display medium (- Figs. 6B, 6C) when the light irradiation section is on, and a reflection mode (- "Backlight is Turned Off", S32 - Fig. 5) in which light incident from a front of the display

medium and transmitted through the display medium is reflected by the reflection section (- Fig. 6A) when the light irradiation section is off; and
- the control section sets the luminance level of [characters and/or graphics] in accordance with the transmission mode or the reflection mode
(- "Display of Characters is returned to Initial State", S34 and "Display is Switched to Reverse Video", S28 - Fig. 5).

Accordingly, in light of PCT-Guidelines IV, Chapter IV-8.8, A1(v), the subject matter of dependent claim 10 is not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D3 within the meaning of Article 33(3) PCT.

3. The second invention of the present application does not meet the criteria of Article 33(1) PCT because the subject-matter of claims 24-41 and claims 14, 15 (dependent upon claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.
- 3.1 The document **D1** is regarded as being the closest prior art and discloses (- cf. independent claims 24 and 33) a display apparatus comprising:
a display device (- 3 - Fig. 8d) including a display screen (- Figs. 1-4) for displaying characters and/or graphics, wherein each of the characters and /or graphics contains a basic portion (- Level 3 - Figs. 1-4; bits "1" or "0" - Figs. 13A-16D and para. [0150]) and a neighbouring portion (- Levels 1, 2 - Figs. 1-4; bits with "*" - Figs. 13A-16D and para. [0150]) arranged in the vicinity of the basic portion; and
a control section (- 20, 40 - Fig. 8d) for controlling the display device;
wherein the control section sets a luminance level of the neighbouring level of the basic portion and a luminance level of neighbouring portion (- "brightness table generation program 6b" - Fig. 8d and individual levels of R,G,B - Fig. 5); and
the control section controls the display device so that the character and/or graphics are displayed on the display screen (- graphic displaying procedure - Fig. 10) using the set luminance of the basic portion and the set luminance level of the neighbouring portion.
- 3.1a The subject-matter of claim 24 therefore differs from that known from D1 in that: the control section controls the display device in accordance with information related to a viewer of the display device.

The problem to be solved by the present invention may therefore be regarded as overcoming different problems a viewer may have of reading a screen should the viewer suffer from e.g. colour blindness, cataracts, etc.

- 3.1b It is noted however that document D4 which discloses a display apparatus (- Fig. 1) and a corresponding display control method therefor (- Figs. 6A, 6B) also discloses, in common with D1:
- a display screen (- "LCD Display 1" - Figs. 1, 2); and
- a control section for controlling the display device (- 24, 40, 43 - Fig. 2).

Furthermore, D4 discloses:

said control section controls the display device in accordance with information

related to a viewer of the display device

- (- "variable font select 24" with "variable font storage 43" - Fig. 2, and
- "displaying text in variable font sizes for the visually impaired individual who would not otherwise comfortably be able to read" - col. 8, lines 1-3).

Accordingly, in light of PCT-Guidelines IV, Chapter IV-8.8, A1(v), the respective subject matters of independent claims 24 and 33 are not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D4 within the meaning of Article 33(3) PCT.

3.2 In addition (- cf. independent claims 40 and 41), insofar as it is well known in the art to employ LCDs as a display monitor of a computer, any said such computer employing:

- a program for displaying characters and/or graphics; and
- a recording medium, storing such a program,

the respective subject matters of independent claims 40 and 41 are also not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D4 within the meaning of Article 33(3) PCT.

3.3 Dependent claims 25-32 and 34-39 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, i.e. see documents D1, D4 and D5 and the corresponding passages cited in the search report. In this respect see:

- D1, particularly in regard to claims 25 and 34, 27-30 and 36-38
(- i.e. see e.g. figs. 1-4 and 9); and
- D4 and D5, particularly in regard to claims 14, 15, 26, 31, 32 and 39
(- i.e. see D4 - "change font size 88" - Fig. 6A); and
(- i.e. see D5 - "If displays use color coding, then color weakness may be a problem. [...]. Avoid using red and green or yellow and blue in pairs." - page 311, Right Column, last two lines to page 312, Left Column, first two lines).

Accordingly, the respective subject matters of dependent claims 25-32 and 34-39 are not considered to involve an inventive step over a non-inventive combination of the teachings of D1 and D4 or D1 and D5 within the meaning of Article 33(3) PCT.